

## Muons in europium (Eu)

Z	A [g/mol]	$\rho$ [g/cm <sup>3</sup> ]	I [eV]	$a$	$k = m_s$	$x_0$	$x_1$	$\bar{C}$	$\delta_0$
63 (Eu)	151.964 (1)	5.244	580.0	0.24448	2.6245	0.1888	3.4633	6.2276	0.14
$T$	$p$ [MeV/c]	Ionization	Brems	Pair prod [MeV cm <sup>2</sup> /g]	Photonucl	Total	CSDA range [g/cm <sup>2</sup> ]		
10.0 MeV	$4.704 \times 10^1$	4.322				4.322	$1.326 \times 10^0$		
14.0 MeV	$5.616 \times 10^1$	3.427				3.427	$2.375 \times 10^0$		
20.0 MeV	$6.802 \times 10^1$	2.716				2.716	$4.363 \times 10^0$		
30.0 MeV	$8.509 \times 10^1$	2.136				2.136	$8.568 \times 10^0$		
40.0 MeV	$1.003 \times 10^2$	1.840				1.840	$1.364 \times 10^1$		
80.0 MeV	$1.527 \times 10^2$	1.404				1.404	$3.928 \times 10^1$		
100. MeV	$1.764 \times 10^2$	1.328				1.328	$5.396 \times 10^1$		
140. MeV	$2.218 \times 10^2$	1.255				1.256	$8.508 \times 10^1$		
200. MeV	$2.868 \times 10^2$	1.222				1.222	$1.337 \times 10^2$		
237. MeV	$3.260 \times 10^2$	1.219	0.000			1.219	<i>Minimum ionization</i>		
300. MeV	$3.917 \times 10^2$	1.224	0.000		0.000	1.225	$2.156 \times 10^2$		
400. MeV	$4.945 \times 10^2$	1.245	0.000		0.000	1.245	$2.966 \times 10^2$		
800. MeV	$8.995 \times 10^2$	1.332	0.001		0.000	1.333	$6.066 \times 10^2$		
1.00 GeV	$1.101 \times 10^3$	1.367	0.001		0.000	1.368	$7.546 \times 10^2$		
1.40 GeV	$1.502 \times 10^3$	1.422	0.002	0.000	0.001	1.425	$1.041 \times 10^3$		
2.00 GeV	$2.103 \times 10^3$	1.481	0.003	0.001	0.001	1.487	$1.453 \times 10^3$		
3.00 GeV	$3.104 \times 10^3$	1.549	0.006	0.003	0.001	1.560	$2.108 \times 10^3$		
4.00 GeV	$4.104 \times 10^3$	1.596	0.008	0.006	0.002	1.612	$2.738 \times 10^3$		
8.00 GeV	$8.105 \times 10^3$	1.702	0.021	0.019	0.003	1.746	$5.113 \times 10^3$		
10.0 GeV	$1.011 \times 10^4$	1.734	0.027	0.027	0.004	1.793	$6.243 \times 10^3$		
14.0 GeV	$1.411 \times 10^4$	1.780	0.042	0.044	0.005	1.872	$8.424 \times 10^3$		
20.0 GeV	$2.011 \times 10^4$	1.825	0.065	0.073	0.007	1.971	$1.155 \times 10^4$		
30.0 GeV	$3.011 \times 10^4$	1.873	0.107	0.127	0.011	2.119	$1.643 \times 10^4$		
40.0 GeV	$4.011 \times 10^4$	1.905	0.151	0.187	0.015	2.258	$2.100 \times 10^4$		
80.0 GeV	$8.011 \times 10^4$	1.975	0.341	0.450	0.029	2.795	$3.689 \times 10^4$		
100. GeV	$1.001 \times 10^5$	1.996	0.441	0.591	0.035	3.065	$4.372 \times 10^4$		
140. GeV	$1.401 \times 10^5$	2.026	0.648	0.883	0.049	3.607	$5.575 \times 10^4$		
175. GeV	$1.752 \times 10^5$	2.046	0.835	1.150	0.061	4.093	<i>Muon critical energy</i>		
200. GeV	$2.001 \times 10^5$	2.057	0.971	1.344	0.070	4.444	$7.071 \times 10^4$		
300. GeV	$3.001 \times 10^5$	2.092	1.522	2.115	0.105	5.836	$9.030 \times 10^4$		
400. GeV	$4.001 \times 10^5$	2.116	2.092	2.914	0.140	7.264	$1.056 \times 10^5$		
800. GeV	$8.001 \times 10^5$	2.176	4.444	6.189	0.283	13.094	$1.461 \times 10^5$		
1.00 TeV	$1.000 \times 10^6$	2.195	5.652	7.865	0.356	16.069	$1.599 \times 10^5$		
1.40 TeV	$1.400 \times 10^6$	2.224	8.073	11.206	0.504	22.009	$1.811 \times 10^5$		
2.00 TeV	$2.000 \times 10^6$	2.256	11.775	16.304	0.730	31.066	$2.039 \times 10^5$		
3.00 TeV	$3.000 \times 10^6$	2.292	17.954	24.776	1.115	46.139	$2.301 \times 10^5$		
4.00 TeV	$4.000 \times 10^6$	2.318	24.215	33.337	1.507	61.379	$2.489 \times 10^5$		
8.00 TeV	$8.000 \times 10^6$	2.383	49.450	67.749	3.130	122.713	$2.941 \times 10^5$		
10.0 TeV	$1.000 \times 10^7$	2.404	62.164	85.045	3.963	153.577	$3.086 \times 10^5$		
14.0 TeV	$1.400 \times 10^7$	2.436	87.524	119.558	5.673	215.192	$3.305 \times 10^5$		
20.0 TeV	$2.000 \times 10^7$	2.471	125.782	171.546	8.292	308.092	$3.537 \times 10^5$		
30.0 TeV	$3.000 \times 10^7$	2.511	189.472	258.043	12.816	462.844	$3.800 \times 10^5$		
40.0 TeV	$4.000 \times 10^7$	2.540	253.386	344.741	17.446	618.115	$3.986 \times 10^5$		
80.0 TeV	$8.000 \times 10^7$	2.612	509.409	691.770	36.772	1240.563	$4.434 \times 10^5$		
100. TeV	$1.000 \times 10^8$	2.635	637.630	865.440	46.750	1552.457	$4.578 \times 10^5$		